

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
SAN ANTONIO DIVISION**

ACULON, INC., A CALIFORNIA
CORPORATION;

Plaintiff

-vs-

ELECTROLAB, INC., A TEXAS
CORPORATION; AND E9
TREATMENTS, INC., A DELAWARE
CORPORATION;

Defendants

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SA-23-CV-00720-XR

ORDER

On this date, the Court considered the parties’ opening claim construction briefs (ECF Nos. 68, 69), the responsive claim construction briefs (ECF Nos. 70, 71), the reply claim construction briefs (ECF Nos. 72, 73), and the parties’ sur-replies (ECF Nos. 74, 75). In addition, the Court considered the arguments made by the parties at the *Markman* hearing held on June 27, 2024, and the joint claim construction charts (ECF No. 59). After careful consideration, the Court issues the following order construing four disputed claim terms.

BACKGROUND

On September 2, 2022, Aculon filed suit in the Southern District of California against Defendants Electrolab, Inc. and e9 Treatments, Inc., alleging, among other things, a cause of action for patent infringement solely against e9. According to Aculon, e9 infringed U.S. Patent No. 8,025,974 (the “’974 Patent”) and U.S. Patent No. 8,236,426 (the “’426 Patent”) (collectively, the “Aculon Asserted Patents”). ECF No. 1.

On May 31, 2023, the Southern District of California transferred the case to this Court. ECF No. 27. On June 14, 2023, Defendants filed a motion to dismiss, challenging Aculon’s causes

of action for “(1) Misappropriation of Trade Secrets; (2) Intentional Interference with Contractual Relations; (3) Intentional Interference with Prospective Economic Advantage; (4) Negligent Interference with Prospective Economic Advantage; and (5) Conversion pursuant to Federal Rules of Civil Procedure 12(b)(6).” ECF No. 32.

On September 21, 2023, Aculon filed its first amended complaint, dropping many of its causes of action but retaining its patent infringement cause of action against e9. On October 5, 2023, e9 filed counterclaims against Aculon asserting infringement of U.S. Patent Nos. 10,059,892 (the “’892 Patent”), 10,150,924 (the “’924 Patent”), 10,934,497 (the “’497 Patent”) (collectively, the “e9 Asserted Patents”).

At a high level, the patents at issue relate to the structure and application of self-assembled monolayers (“SAMs”). SAMs are molecules that can bond with clean surfaces to form thin coatings because of their molecular structure. ECF No. 69 at 2. When the head of the SAM molecule includes the element phosphorous, the molecules are referred to as self-assembled monolayers of phosphonate (“SAMPs”). ECF No. 69 at 2. SAMs and SAMPs have a variety of applications. ECF No. 68 at 4.

On February 16, 2024, the parties filed their joint claim construction brief, identifying four claim terms in dispute. ECF No. 59. On March 29, 2024, the parties filed their opening claim construction briefs. ECF Nos. 68, 69. On April 12, 2024, the parties filed their respective responsive claim construction briefs. ECF Nos. 70, 71. On April 19, 2024, the parties filed their replies. ECF Nos. 72, 73. And on April 26, 2024, the parties filed their sur-replies. ECF Nos. 74, 75. On June 27, 2024, the Court held a *Markman* hearing and heard argument on the disputed terms.

DISCUSSION

I. Legal Standard

Claim construction is a matter of law. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996). “The purpose of claim construction is to ‘determine the meaning and scope of the patent claims asserted to be infringed.’” *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360 (Fed. Cir. 2008) (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), *aff’d* 517 U.S. 370 (1996)). “When the parties present a fundamental dispute regarding the scope of a claim term, it is the court’s duty to resolve it.” *O2*, 521 F.3d at 1362.

Claim terms “are generally given their ordinary and customary meaning.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). The ordinary and customary meaning of a term “is the meaning that the term would have to a person of ordinary skill in the art in question at the time of invention[.]” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005). “In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent[.]” *Id.* at 1314. “[C]laim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” *Id.* Indeed, “[w]hile claim construction is a matter for the Court, it need not provide a new definition or rewrite a term, particularly when the Court finds the term’s plain and ordinary meaning is sufficient.” *Alexam, Inc. v. Best Buy Co.*, No. 2:10CV93, 2012 U.S. Dist. LEXIS 49511, at *18 (E.D. Tex. Apr. 9, 2012).

However, “because the meaning of a claim term as understood by persons of skill in the art is often not immediately apparent, . . . the court looks to ‘those sources available to the public that show what a person of skill in the art would have understood disputed claim language to

mean.” *Phillips*, 415 F.3d at 1314 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)). “Those sources include ‘the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.’” *Id.*

“To properly construe a claim term, a court first considers the intrinsic evidence, starting with the language of the claims.” *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1369–70 (Fed. Cir. 2005) (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996)). “If the meaning of a claim term is clear from the intrinsic evidence, there is no reason to resort to extrinsic evidence.” *Seabed Geosolutions (US) Inc. v. Magseis FF LLC*, 8 F.4th 1285, 1287 (Fed. Cir. 2021). In turn, courts “resort to extrinsic evidence to construe claims only if it is consistent with the intrinsic evidence.” *Id.*; *see also Phillips*, 415 F.3d at 1318.

II. Analysis

a. Applicable Person of Ordinary Skill in the Art

The parties submit two different persons of ordinary skill in the art for the patents at issue—one for the e9 Asserted Patents and one for the Aculon Asserted Patents. The Court addresses each below.

i. Person of Ordinary Skill in the Art for the e9 Asserted Patents

First, with respect to the e9 Asserted Patents, Aculon submits that the applicable person of ordinary skill in the art “should be someone with at least a Bachelor of Science in Chemistry.” ECF No. 68 at 7. e9, however, contends that “[e]9’s patents relate to the use of known chemicals to treat sensors and measuring devices exposed to paraffin and/or asphaltene compounds in oil field applications,” and that “[e]9’s patents are not specifically directed to the chemistry of

SAM's.” ECF No. 71 at 3–4. Accordingly, e9 contends that a person of ordinary skill in the art for the e9 Asserted Patents would be “a person having some oil field experience with sensors and measuring devices.” *Id.*

The Court finds Aculon's argument more persuasive. “In resolving the level of ordinary skill, courts consider the types of and solutions to problems encountered in the art, the speed of innovation, the sophistication of the technology, and the education of workers active in the field.” *See Luminati Networks, Ltd. v. Teso LT, UAB*, No. 2:19-CV-00395-JRG, 2020 WL 7222818, at *4 (E.D. Tex. Dec. 7, 2020). Here, though the e9 Asserted Patents are not directed specifically to the structure of SAMs, the e9 Asserted Patents are nonetheless directed to the interaction of SAMs to a metal substrate, suggesting that the person of ordinary skill in the art would have an educated understanding of chemistry. *See, e.g.*, '924 Patent at 6:43–54.¹

Take for example, the '924 Patent. The '924 Patent's specification uses technical jargon, such as “nanoscale coating” and “phosphorous acid.” *Id.* at 4:1–5, 6:43–54. As Aculon points out, a person lacking a sophisticated understanding of chemistry “would . . . not have the knowledge or education to understand that ‘SAMP may be combined with a glycol carrier’; ‘phosphonate is a phosphorous acid connected with a carbon-based group through a highly stable phosphorus carbon bond’; ‘phosphonic acid reacts with the component surface through stable metal phosphorus bonds, and the carbons are chosen for their non-stick chemical functionality’; ‘SAMP is covalently bound to the substrate, forming a durable, low-surface tension, non-stick surface’; or that the ‘chemical bond is highly stable under ambient conditions.’” ECF No. 72 at 5 (citing '924 Patent

¹ When citing to the respect patents at issue in this case, the Court will refer to those patents as follows: ECF No. 59-1 at 3–11 (“'974 Patent”), ECF No. 59-1 at 12–18 (“'426 Patent”), ECF No. 59-1 at 19–32 (“'924 Patent”), ECF No. 59-1 at 34–45 (“'892 Patent”), and ECF No. 59-1 at 49–60 (“'497 Patent”).

at 3:66; 4:2–14). Moreover, the '924 Patent's claims similarly disclose a complexity that would likely be lost on one with only oil field experience—claim 1 of the '924 Patent reads:

A system comprising: [1] a liquid environment that comprises at least one contaminant selected from the group consisting of paraffins and asphaltene; and, [2] a protective layer comprising a surface, said surface residing within and in contact with the environment, wherein the protective layer comprises *a self assembled monolayer of phosphonate, with a metal-phosphorous covalent bond formed between an underlying metal substrate and the protective layer*, said bonded layer reducing paraffin or asphaltene deposition on the underlying metal substrate.

'924 Patent at 6:43–54 (emphasis added). The '924 Patent's prosecution history similarly suggests that the person of ordinary skill in the art would have a background in chemistry. *See, e.g.*, ECF No. 59-1 at 212–123 (explaining “perfluoropolymers comprise linked-up single molecules which comprise long chains bound together by covalent bonds as is understood in the art”). In light of the above, the '924 Patent's level of sophistication militates in favor of Aculon's position. *See In re GPAC Inc.*, 57 F.3d 1573, 1579–80 (Fed. Cir. 1995).

In response, e9 contends that the e9 Asserted Patents “are all limited, one way or another, to oil field or hydrocarbon applications where paraffins and/or asphaltenes are present.” ECF No. 75 at 2. Of course, it is true that the e9 Asserted Patents are aimed at the use of SAMs in the oilfield context. *See, e.g.*, '892 Patent at 1:21–23 (“The present invention relates to paraffin and asphaltene deposition on components used in crude oil service operations.”). But considering the degree of sophistication needed as disclosed by the specification, claims, and prosecution history, the Court concludes that Aculon's proposed level of skill is the correct one.

Accordingly, the Court concludes that the person of ordinary skill in the art for the e9 Asserted Patents to be a person with at least a Bachelor of Science in chemistry.

ii. Person of Ordinary Skill in the Art for the Aculon Asserted Patents

Second, with respect to the Aculon Asserted Patents, Aculon contends that a person of ordinary skill in the art “would have a would have either a masters [sic] or a Ph.D. in chemistry and some experience with synthetic organic chemistry. More experience could compensate for less education, and vice versa.” ECF No. 70 at 6. e9 does not dispute Aculon’s proposed person of ordinary skill in the art for the Aculon Asserted Patents. ECF No. 73 at 2 n.1.

Accordingly, the Court concludes that the appropriate person of ordinary skill in the art for the Aculon Asserted Patents is one with either a master’s or a Ph.D. in chemistry and some experience with synthetic organic chemistry, with more experience compensating for less education, and vice versa.

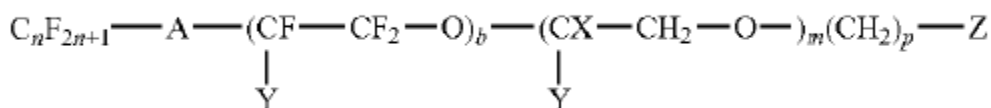
b. Contested Claim Terms

The parties ask the Court to construe four claim terms. The parties’ proposed constructions for each of the four claim terms all establish a fundamental dispute on the scope of the claim terms. Construction of each disputed claim term is therefore necessary.

i. “where A is an oxygen radical or a chemical bond”

The parties submit that the term “where A is an oxygen radical or a chemical bond” appears in claims 1 and 19 of the ’974 Patent and claim 1 of the ’426 Patent. e9 requests that the Court construe the term to mean that “A is either [1] an oxygen radical or [2] a chemical bond directly

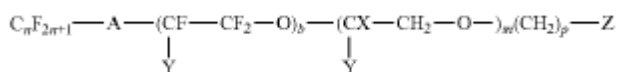
between the C_nF_{2n+1} group on the left side of ‘A’ in the chemical structure and the (CF1— . . . Z group on the right, as shown in the figure below from claims 1 and 19 of the ‘974 Patent.”²



ECF No. 59-1 at 2; ECF No. 69 at 4–8. Aculon, however, asks that the Court construe the term according to its plain and ordinary meaning, wherein “oxygen radical” means “a molecule containing an oxygen atom with an available electron” and “chemical bond” means “interactions that account for the association of atoms into molecules, ions, crystals, and other stable species.” ECF No. 59-1 at 2; ECF No. 70 at 6–10.

e9 argues that “[t]he Aculon patent claims state, in no uncertain terms, that ‘A is an oxygen radical or a chemical bond.’” ECF No. 69 at 5. First, the specifications of the ‘974 and ‘426 Patents, e9 asserts, do not disclose where A is any element other than oxygen. According to e9, Aculon’s proposed construction “excludes ‘A’ from being any element other than oxygen, as the explicit, plain, and ordinary meaning of the claim requires.” *Id.* at 5–6. Second, e9 contends that “the option where ‘A’ can be a chemical bond is not a license to make ‘A’ include any other element from the periodic table of the elements as part of the ‘chemical bond.’” *Id.* at 7. Rather, e9 insists that its construction is supported by the specification as the ‘974 Patent shows “the lasting attraction is *between* the carbon atoms in CF₃ on the left and CF₂ on the right.” *Id.* (emphasis in original).

² Similarly, e9 asks that, with respect to the ‘426 Patent, the Court construe “where A is an oxygen radical or a chemical bond” to mean “A is either an oxygen radical or a chemical bond directly between the C_nF_{2n+1} group on the left side of ‘A’ in the chemical structure and the (CF1— . . . Z group on the right, as shown in the figure below from claim 1 of the ‘426 Patent:”



ECF No. 59-1 at 2.

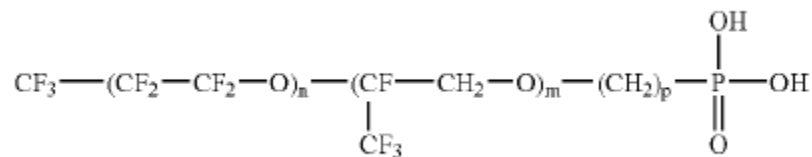
Aculon makes two arguments in response. First, “[t]he plain and ordinary meaning of an oxygen radical to a [person of ordinary skill in the art] at the time the application was filed,” Aculon argues, “was a molecule containing an oxygen atom with an available electron.” ECF No. 70 at 6. According to Aculon, there are a number of possible oxygen radicals and anyone of which fall within “oxygen radical” as used in the ’974 and ’426 Patents. *Id.* at 6–7. Moreover, Aculon contends that “[t]here is nothing in the specification that indicates A can only be oxygen, and not any other oxygen radical.” *Id.* at 8. Second, “[t]he plain and ordinary meaning of ‘chemical bond’ to a [person of ordinary skill in the art] at the time the application was filed” Aculon insists, “was the interactions that account for the association of atoms into molecules, ions, crystals, and other stable species.” *Id.* at 9. In support of its position, Aculon submits extrinsic evidence defining “chemical bonding” and argues that e9’s proposed construction improperly limits the meaning of “chemical bond.” *Id.* at 9–10.

Here, a person of ordinary skill in the art at the time of the invention, after reading the claims in light of the ’974 and the ’426 Patents’ claims, specifications, and prosecution histories, would understand “where A is an oxygen radical or a chemical bond” to mean “where A is a molecule containing an oxygen atom with an available electron or a chemical bond directly between the C_nF_{2n+1} group on the left side of A and the $(CF-CF_2-O)_b$ group on the right side of A.”

First, with respect to “oxygen radical,” the Court finds Aculon’s proposed construction appropriate and construes this term to mean “a molecule containing an oxygen atom with an available electron.” To start, though the claim language refers to an “oxygen radical,” the specifications note that “[p]referably . . . A is oxygen.” *See* ’974 Patent” at 3:36-37; ’426 Patent at 3:30–40. The differing use of these terms suggests that “oxygen radical” is not limited to only

“oxygen.” *See CAE Screenplates, Inc. v. Heinrich Fiedler GmbH & Co. KG*, 224 F.3d 1308, 1317 (Fed. Cir. 2000) (“In the absence of any evidence to the contrary, we must presume that the use of these different terms in the claims connotes different meanings.”). Moreover, the ’974 Patent’s dependent claim 23 claims a molecular structure where A is oxygen. ’974 Patent at 10:66–67. And the ’974 Patent’s dependent claim 7 includes a limitation that “the substrate of claim 1 in which A is oxygen.” ’974 Patent at 9:59–60. Again, the use of “oxygen” rather than “oxygen radical” in the dependent claims suggests that “oxygen” and “oxygen radical” have different meanings. *See CAE Screenplates*, 224 F.3d at 1317. Further, extrinsic evidence submitted by Aculon is consistent with a broader construction where “oxygen radical” encompasses any molecule containing an oxygen atom with an available electron. *See* ECF No. 70-1 at 2 (defining “radical” as “a molecular entity . . . possessing an unpaired electron.”); No. 70-2 at 2 (discussing the formation and properties of oxygen radicals and reciting OH, O[·], O₂[·], H₂O₂[·], O₃[·], ROO[·], RO[·] as the “principle [sic] oxygen centered radicals”).

Second, with respect to “chemical bond,” the intrinsic evidence suggests that a person of ordinary skill in the art would understand “chemical bond” to mean “a chemical bond directly between the C_nF_{2n+1} group on the left side of A and the (CF–CF₂–O)_b group on the right side of A.” To start, the ’974 and the ’426 Patents’ specifications demonstrate a possible molecular structure where A is a chemical bond:



’974 Patent at 8:35–44; ’426 Patent at 8:35–44. The specifications, however, offer no other examples where A is a chemical bond. *See* ’974 Patent; ’426 Patent. And Aculon does not provide

any other possible molecular structures in its briefing where A is a chemical bond. *See* ECF Nos. 70, 74.

While the Court is cautious of unnecessarily limiting the scope of “chemical bond” by limiting it to the example disclosed in the Aculon Asserted Patents, *Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012), Aculon’s proposed construction of “chemical bond” would allow *any element or functional group* to take the place of A because any element or functional group could allegedly be part of a “chemical bond,” as defined by Aculon. *See, e.g.*, ECF No. 70 at 10 (“Chemical bond, as the term is used in the definition of component A, means any type of chemical bond without limitation to the type of bond or elements involved in the bond.”); ECF No. 74 at 7 (“The claim language speaks for itself, and only requires a ‘chemical bond’ without any limitations as to what functional groups form the chemical bond or what elements are in the chemical bond. Aculon chose to use the claim language ‘chemical bond’ without any limitations or specifications on what atoms are, or are not, included in the bond, the number of atoms on the bond, or the locations of the atoms within the bond.”). This proposed construction, however, is untethered from the claim language. Specifically, if “chemical bond” could include *any* element or functional group as part of that “bond,” then “chemical bond” would swallow “oxygen radical” whole. And “oxygen radical” would be rendered superfluous.³ Such a construction is strongly disfavored. *See Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) (“A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”).

³ If the patentee intended to make such a broad claim, the patentee could have used language such as “where A is an additional element or functional group.” But the patentee didn’t. The patentee claimed “where A is an oxygen radical or a chemical bond.”

Further, Aculon does not point to any intrinsic evidence supporting its broad reading of “chemical bond.” *See* ECF Nos. 70, 74. Instead, Aculon points to extrinsic evidence—an excerpt from the Encyclopedia Britannica—in support of its position. ECF No. 70 at 9; ECF No. 74 at 6. However, it is a fundamental canon of construction that “[i]f the meaning of a claim term is clear from the intrinsic evidence, there is no reason to resort to extrinsic evidence.” *Seabed Geosolutions*, 8 F.4th at 1287; *see also Profectus Tech. LLC v. Huawei Techs. Co.*, 823 F.3d 1375, 1380 (Fed. Cir. 2016) (“Extrinsic evidence may not be used ‘to contradict claim meaning that is unambiguous in light of the intrinsic evidence.’”). Moreover, even if “chemical bond” is properly characterized as “interactions that account for the association of atoms into molecules, ions, crystals, and other stable species,” Aculon does not consider how “chemical bond” as used here would be understood by a person of ordinary skill in light of the intrinsic evidence. Indeed, Aculon’s proposed plain and ordinary meaning is consistent with e9’s proposed construction as a person of ordinary skill in the art would understand “chemical bond” here to refer to the association of the atoms in the C_nF_{2n+1} group on the left side of A with the atoms of the $(CF-CF_2-O)_b$ group on the right side of A.

Accordingly, the Court construes the term “where A is an oxygen radical or a chemical bond” in claims 1 and 19 of the ’974 Patent and claim 1 of the ’426 Patent to mean “where A is a molecule containing an oxygen atom with an available electron or a chemical bond directly between the C_nF_{2n+1} group on the left side of A and the $(CF-CF_2-O)_b$ group on the right side of A.”

ii. “metal-phosphorous covalent bond”

The parties submit that the term “metal-phosphorous covalent bond” appears in claims 1 and 5 of the ’924 Patent. *See* ECF No. 59 at 3; ’924 Patent at 6:50–51. Aculon requests the Court

construe “metal-phosphorous covalent bond” to mean “a direct covalent bond between a metal atom and a phosphorous atom without one or more atoms between the metal and phosphorous atoms.” ECF No. 68 at 8. In contrast, e9 asks the Court to construe the term “metal-phosphorous covalent bond” according to its plain and ordinary meaning, which it argues “requires that the ‘covalent bond [is] formed between an underlying metal substrate and the protective layer.’” *Id.*; ECF No. 71 at 4–10.

Aculon contends that its “proposed construction is the ordinary and customary meaning that the term would have to a person of ordinary skill in the art.” ECF No. 68 at 8. According to Aculon, “a person of ordinary skill in the art would understand a ‘metal phosphorus covalent bond’ to mean a metal atom of the component surface bonded directly to the phosphorous atom of the SAMP through a covalent bond.” *Id.* at 9. The ’924 Patent, Aculon insists, “do[es] not provide any definition or explanation of a covalent bond.” *Id.* Pointing to extrinsic evidence, Aculon notes that “Encyclopedia Britannica defines ‘covalent bond’ as the *interatomic linkage* that results from the sharing of an electron pair *between two atoms*.” *Id.* (emphasis in original) (citing ECF. No. 59-1 at 306). Further, Aculon asserts that “[i]t is customary in the chemistry field to use the terminology ‘x-x bond’ to refer to a direct bond between the two components.” *Id.*

In response, e9 points to the surrounding language of Claim 1—“a metal-phosphorous covalent bond formed between an *underlying metal substrate and the protective layer*.” ’924 Patent at 6:50–52. According to e9, in light of this language, “the bond is specified to be ‘between an underlying metal *substrate* and the protective layer’ . . . , and not between the underlying metal and the protective layer.” ECF No. 71 at 4. In making this argument, e9 recites the prosecution history of the ’924 Patent, noting that the inventors originally sought to claim a layer covalently

bonded to the ‘surfaces of said device.’” *Id.* at 5.⁴ But after two rejections,⁵ the patent examiner allowed e9’s amended claims, which claimed a “metal-phosphorous covalent bond formed between the metal substrate and the [SAMP] protective layer” *Id.* at 6. In e9’s view, a metal-phosphorous bond could mean any number of bonds, including “metal-phosphorous, metal surface-phosphorous, metal substrate-phosphorous, metal oxide-phosphorous, [or] metal hydroxyl-phosphorous.” *Id.* at 7. Lastly, e9 argues that Aculon proposes a construction that defies laws of chemical bonding and takes issue with the level of atomic detail pressed by Aculon, noting that “the word ‘atom’ appears only once in the ‘924 Patent.” *Id.* at 7.

Here, a person of ordinary skill in the art at the time of the invention, after reading the claims in light of the ‘924 Patent’s claims, specification, and prosecution history, would understand “metal-phosphorous covalent bond” to mean “a covalent bond between a metal atom and a phosphorous atom.”

To begin, the ‘924 Patent’s prosecution history forecloses e9’s proposed construction. During prosecution, e9’s sought to secure claim language very similar to the construction it now urges the Court to adopt. *Compare* ECF No. 59-1 at 217 (“wherein the protective layer is

⁴ As filed, claim 1 read as follows:

A method for treating a device utilized in a crude oil service operation, wherein the device comprises at least one surface, the method comprising the steps of: [1] cleaning the surface to remove surface contamination; [2] drying the cleaned surface of the device; [3] applying a coat of a bonded layer composition to the clean and dried surfaces of said device to form a treated device, wherein the bonded layer is a molecularly bonded layer or a covalently bonded layer, said bonded layer reducing paraffin or asphaltene deposition on the said surfaces; [4] installing said treated device into a section of a crude oil service operation; and, [5] contacting the surface with a contaminant, wherein the contaminant is selected from the group consisting of paraffins and asphaltenes.

ECF No. 59-1 at 198.

⁵ e9 arrived at the present claim language after the examiner rejected the as-filed claims based on (1) “the ‘Clevenger’ prior art which taught ‘that SAMP coatings may form molecular [or] covalent bonds with surfaces,’” and (2) “the ‘Golding’ prior art, which in [the examiner’s] view showed covalent bonding through an intermediate layer of epoxy resin.” *Id.* at 5–7.

covalently bonded to an underlying metal substrate”) *with* ECF No. 71 at 10 (“[E]9 contends that the claim language should have its plain and ordinary meaning which explicitly requires that the ‘covalent bond [is] formed between an underlying metal substrate and the protective layer.’”). But the patent examiner rejected that claim language as obvious in light of the prior art. ECF No. 59-1 at 227–28 (“[B]efore the effective filing date of the claimed invention it would have been obvious to one of ordinary skill in the art, to modify the system of McKeen with the covalent bonding of the protective layer to the underlying substrate as suggested by Golding.”). e9 thereafter amended the claim language to include the “metal-phosphorus covalent bond” language now at issue. And the patent examiner only allowed the claims to move forward on the basis that the prior art “fail[ed] to critically teach that the protective layer comprises a self-assembled monolayer of phosphonate, with a metal-phosphorous covalent bond formed between the metal substrate and the protective layer.” ECF No. 59-1 at 241–42.⁶ But as Aculon argues in reply, e9 is foreclosed from arguing the broader construction of “metal-phosphorus covalent bond.” *See Respironics, Inc. v. Invacare Corp.*, 303 F. App’x 865, 871 (Fed. Cir. 2008) (explaining that a patentee is foreclosed from pursuing a broader construction it had abandoned in prosecuting the patent).

In addition, e9’s proposed construction would effectively read out “metal-phosphorus” from the claim language. e9’s arguments focus primarily on the “formed between an underlying metal substrate and the protective layer” language coming after “metal-phosphorous covalent bond.” ECF No. 71 at 4–7. In light of this language, e9 contends, “metal-phosphorous covalent bond” could mean any number of covalent bonds such as “metal-phosphorous, metal surface-

⁶ Notably, the Patent Examiner rejected the as-filed claims as the prior art “teaches that SAMP coatings may form molecular of covalent bonds with surfaces” and “at the time the invention was made it would have been obvious to one of ordinary skill in the art, that the SAMP coating in the system of claim 1 of U.S. Pat. No. 9,476,754 would form a molecular or covalent bonds with the tubing surface as suggested by Clevenger in order to arrive at the instant invention.” ECF No. 59-1 at 209.

phosphorous, metal substrate-phosphorous, metal oxide-phosphorous, metal hydroxyl-phosphorous.” ECF Noi. 71 at 7. But a proper claim construction does not “revise or ignore the explicit language of the claims.” *Generation II Orthotics Inc. v. Med. Tech. Inc.*, 263 F.3d 1356, 1365 (Fed. Cir. 2001). And “[a] claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.” *Merck*, 395 F.3d at 1372. If the Court adopted e9’s broad proposed construction, “metal-phosphorus” would become largely duplicative of “between an underlying metal substrate and the protective layer.”

Of course, e9 takes issue with Aculon’s proposed construction, claiming it is too granular in its view of “metal-phosphorus covalent bond” because the ’924 Patent does not allegedly speak in atomic detail. ECF No. 71 at 7. Yet, e9’s argument ignores the remainder of the specification. To be sure, e9 is correct that there is only one use of the word “atom” in the specification of the patent. *See* ’924 Patent at 1:47. But the ’924 Patent specification speaks in terms of “nanoscale coating that is one molecule thick” and discusses the bonding of one molecule to another. ’924 Patent at 4:1–13. And, as Aculon observes, “atomic details are inherent based on the claim language used in the ’924 Patent.” ECF No. 72 at 8. Similarly, the prosecution history demonstrates that atomic details are inherent in understanding the ’924 Patent, and that history discloses the granularity and precision with which the technical terms here should be understood. This suggests that Aculon’s proposed construction is properly granular.⁷

Indeed, the extrinsic evidence further supports Aculon’s construction and is consistent with the intrinsic evidence. To begin with, neither party points the Court towards any intrinsic evidence that defines “covalent bond.” *See* ’924 Patent; ECF Nos. 68, 71. Thus, the Court turns to extrinsic

⁷ The Court declines e9’s invitation to rely on the Aculon Asserted Patents in construing the e9 Asserted Patent terms at issue. *e.Digital Corp. v. Futurewei Techs., Inc.*, 772 F.3d 723, 727 (Fed. Cir. 2014) (“[U]nrelated patents must be construed separately.”).

evidence to determine what a person of ordinary skill in the art would ascribe to “covalent bond.” Here, the extrinsic evidence presented defines a covalent bond as “the interatomic linkage that results from the sharing of an electron pair between two atoms.” ECF No. 59-1 at 306. Accordingly, a person of ordinary skill in the art would interpret “covalent bond” on an atomic level, requiring a specific type of bond—a covalent bond—linking two atoms. And the extrinsic evidence further demonstrates that a plain reading of “metal-phosphorus covalent bond” would mean a covalent bond between a phosphorous atom and a metal atom. *Cf.* ECF No. 68-1 at 14–18 (explaining “[t]he carbon–fluorine bond is a polar covalent bond between carbon and fluorine that is a component of all organofluorine compounds”).

Lastly, even if this construction defies the laws of chemical bonding, as e9 contends, the intrinsic and extrinsic evidence is clear. Of course, “a construction that renders the claimed invention inoperable should be viewed with extreme skepticism.” *Talbert Fuel Sys. Pats. Co. v. Unocal Corp.*, 275 F.3d 1371, 1376 (Fed. Cir.), cert. granted, *judgment vacated and remanded on other grounds*, 537 U.S. 802 (2002). But “courts may not redraft claims, whether to make them operable or to sustain their validity.” *AIA Eng’g Ltd. v. Magotteaux Int’l S/A*, 657 F.3d 1264, 1278 (Fed. Cir. 2011) (quoting *Chef Am., Inc. v. Lamb–Weston, Inc.*, 358 F.3d 1371, 1374 (Fed.Cir.2004)).

Accordingly, the Court construes “metal-phosphorus covalent bond” to mean “a covalent bond between a metal atom and a phosphorous atom.”

iii. “wetted part”

The parties submit that the term “wetted part” appears in claim 2 of the ’924 Patent. *See* ECF No. 59 at 3; ’924 Patent at 6:55–56. Aculon asks that the Court construe “wetted part” to mean “any surface that has contact with pressurized well fluid.” ECF No. 68 at 10. In e9’s view,

the Court should construe “wetted part” according to its plain and ordinary meaning, wherein “wetted part” means “a part of the sensor assembly that comes into contact with hydrocarbon liquids or other liquids.” ECF No. 71 at 10–11.

In its briefing, Aculon contends that “[t]he meaning of the term “wetted part” as used in claim 2 of the ‘924 Patent is not clear and the specification of the ‘924 provides no guidance on its meaning,” and Aculon then observes that the ‘924 Patent mentions wetted part only once in the specification. ECF No. 68 at 10. As such, Aculon directs the Court to the definition of “wetted part” in an oil and gas drilling dictionary, which “defines wetted surface as any surface that has contact with pressurized well fluid, either by design or because of internal seal leakage.” *Id.* (citing ECF No. 59-1 at 312).

On the other hand, e9 insists that “wetted part” should not be so limited and instead should be accorded its plain and ordinary meaning, wherein “wetted part” means “a part of the sensor assembly that comes into contact with hydrocarbon liquids or other liquids.” ECF No. 71 at 10–11. e9 does not dispute that “wetted part” term is found only once in the ‘924 Patent specification. *Id.* at 10. But e9 argues that the specification, and other intrinsic evidence, is consistent with a plain and ordinary construction of “wetted part.” First, the specification’s sole reference is to “wetted parts and/or entire sensor assemblies,” which makes clear that ““wetted part” refers only to the wetted *part* of the sensor assembly and not the ‘*entire* sensor assembly”” *Id.* (emphasis in original). Second, the specification describes, e9 points out, the invention “as useful for the ‘surfaces that come into contact with hydrocarbon liquids.”” *Id.* Third, “[d]uring prosecution, the Patent Examiner referred to the ‘McKeen’ prior art and construed wetted part to include a ‘surface designed to come in contact with crude oil comprised of hydrocarbons such that the surface will

be wetted.” *Id.* at 11 (citing 59-1 at 212). And the McKeen prior art “describes contact also with water or with salt water.” *Id.* (citing 59-1 at 260).

Here, the Court finds e9’s proposed construction to be the correct one. To begin, though the intrinsic evidence does not explicitly define “wetted part,” the specification repeatedly describes the invention as a useful method for sensors coming into contact with hydrocarbon liquids, such as crude oil. *See* ’924 Patent at 1:22–24 (“The present invention relates to paraffin and asphaltene deposition on components used in crude oil service operations.”); *id.* at 4:17–22 (“Field trials with components treated via the present inventive process indicate a significant reduction of paraffin/asphaltene deposition on stainless steel sensor components installed in crude oil storage tanks operated in low acidity/low turbulence applications at normal temperatures.”); *id.* at 5:16–18 (“4A-4C allow crude oil to flow through the sensors, 70A-70C and become exposed to the sensor core 78A-78C.”); *id.* at 6:18–21 (“The present invention is useful for surfaces that come into contact with hydrocarbon liquids, including both crude oils and condensates, in which paraffins and/or asphaltenes are present or may become present.”); *id.* at 6:22–26 (“Non-limiting examples of commercial applicability of the present invention include petroleum production, petroleum pipelines, petroleum equipment (storage tanks and specialty vessels, etc.), and petroleum sensor and instrument manufacturing.”). Similarly, the prosecution history’s analysis of the prior art favors e9’s proposed construction as well. *See* ECF No. 59-1 at 212 (construing “wetted part” in prior art to mean a “surface designed to come in contact with crude oil comprised of hydrocarbons such that the surface will be wetted”). Accordingly, the intrinsic evidence demonstrates that “wetted part” is not limited only to those parts that come into contact with pressurized well fluid, as Aculon suggests.

Of course, in reply, Aculon points out that the '924 Patent's claim 1 already requires "a liquid environment" and, as claim 2 is dependent on claim 1, construing "wetted part" to according to its plain and ordinary meaning would render claim 2 superfluous. ECF No. 72 at 11–12.⁸ As such, Aculon insists its proposed construction is proper. *Id.* The Court disagrees.

Though, as Aculon observes, courts should generally "strive[] to reach a claim construction that does not render claim language in dependent claims meaningless," *McNeil Pharm. v. Mylan Lab'ys, Inc.*, 520 F.3d 1358, 1362 (Fed. Cir. 2008), "[t]he preference for giving meaning to all terms . . . is not an inflexible rule that supersedes all other principles of claim construction." *Uniloc 2017 LLC v. Apple Inc.*, 843 F. App'x 305, 312 (Fed. Cir. 2021) (quoting *SimpleAir, Inc. v. Sony Ericsson Mobile Commc'ns AB*, 820 F.3d 419, 429 (Fed. Cir. 2016)). As explained above, the intrinsic evidence weighs heavily in favor of e9's construction, even if that construction may render claim 2 superfluous. Indeed, the Federal Circuit "has adopted a construction rendering dependent claims meaningless when that construction was supported by either the specification or the prosecution history." *Barrday, Inc. v. Lincoln Fabrics Inc.*, No. 2022-1903, 2023 WL 7871688, at *7 (Fed. Cir. Nov. 16, 2023). Importantly, Aculon only points to extrinsic evidence from an oil and gas drilling dictionary in support of its position that "wetted part" is limited to "any surface that has contact with pressurized well fluid." However, the '924 Patent is not limited to the use of the claimed method in drilling applications nor does the '924 Patent's specification mention "pressurized well fluid."

Accordingly, the Court concludes that a person of ordinary skill in the art at the time of the invention, after reading the claim in light of the '924 Patent's claims, specification, and prosecution

⁸ In its sur-reply, e9 concedes that "[t]he dependent claim limitation 'wetted part' may be a superfluous claim limitation to the 'liquid environment' term from the independent claims." ECF No. 75 at 4.

history, would understand “wetted part” to mean “a part of the sensor assembly that comes into contact with hydrocarbon liquids or other liquids.”

- iv. “said SAMP composition reducing paraffin or asphaltene deposition on the at least one of said surfaces”

The parties submit that the term “said SAMP composition reducing paraffin or asphaltene deposition on the at least one of said surfaces” appears in claims 1, 4, 7, and 13 of the ’892 Patent. *See* ECF No. 59 at 3; ’892 Patent at 6:50–52, 6:65–67, 7:13–15, 8:5–17. Aculon asks that the Court construe this term to mean “said SAMP composition *capable of* reducing paraffin or asphaltene deposition on the at least one of said surfaces.” ECF No. 68 at 10–13. In contract, e9 contends the Court should construe the term according to its plain and ordinary meaning. ECF No. 71 at 11–13.

Aculon submits that the term “requires construction because the claims are unclear as written.” ECF No. 68 at 11. According to Aculon, “the claims are all written such that there is no exposure to paraffin or asphaltene,” and “[i]f there is no exposure to asphaltene or paraffin, then there can be no reduction of paraffin or asphaltene deposition.” *Id.* For example, Aculon observes, “[c]laim 1 includes the steps of cleaning, drying, and applying a coat of SAMP to the cooperating surface, but does not provide for the introduction of asphaltene or paraffin to the at least one cleaned and dried surface.” *Id.* And, Aculon argues, this problem is shared by claims 4, 7, and 13 of the ’892 Patent. *Id.* at 11–12. In addition, dependent claims 10–12 “expressly claim[] that the surface with the SAMP is put in contact with contaminants such as crude oil, paraffin, or asphaltenes.” *Id.* at 12. Moreover, Aculon contends that the claim language of e9’s related patents also supports Aculon’s proposed construction as “[c]laim 1 of the ’497 Patent clearly requires the treated surfaces of the device to come into contact with a deposition forming contaminant selected from the group consisting of paraffins or asphaltene.” *Id.* Lastly, the specification, Aculon insists,

“provides that the SAMP applied to surfaces produces permanent changes in the molecular characteristics of the surface, making the surface highly resistant to solids deposition in the extreme process environments normally encountered in petroleum production facilities, such as paraffin and asphaltene.” *Id.* And, as such, “the surfaces become capable of resisting paraffin or asphaltene deposition once treated with the SAMP.” *Id.*

On the other hand, e9 asserts that “reducing” should be construed as something occurring the present time because “reducing” “is grammatically a present participle.” ECF No. 71 at 12. e9 insists this understanding “is completely consistent with the specification of the ‘892 patent which states that the invention is for reducing paraffin or asphaltene deposition.” *Id.* at 11–12. And e9 contends Aculon’s proposed construction is fundamentally flawed as the disputed term requires “some exposure to paraffins or asphaltenes for the invention to complete the method step of ‘reducing paraffin or asphaltene deposition.’” *Id.* Further, e9 argues the Court should not broaden the definition of “reducing” to mean “capable of reducing” as “Aculon has not overcome the heavy presumption that ‘reducing’ means ‘reducing’ in the present tense.” *Id.* at 13.

Here, a person of ordinary skill in the art at the time of the invention, after reading the claims in light of the ‘892 Patent’s claims, specification, and prosecution history, would understand “said SAMP composition reducing paraffin or asphaltene deposition on the at least one of said surfaces” to mean “said SAMP composition capable of reducing paraffin or asphaltene deposition on the at least one of said surfaces.”

To begin, though e9 is correct that “reducing” can express present action, “reducing,” as a participle, can also be used “to form adjectives.” *Zen Design Grp. Ltd. v. Scholastic, Inc.*, No. 16-12936, 2018 U.S. Dist. LEXIS 61032, at *15 (E.D. Mich. Apr. 11, 2018). Upon review of ‘892 Patent, “reducing” undoubtedly acts as an adjective here and begins a phrase that explains the

functionality of the SAMP composition. “Reducing” does not describe the reduction of paraffins or asphaltenes in the present tense.

Take for example claim 1 of the ’892 Patent. Claim 1 reads:

1. A method for treating cooperating surfaces comprising a first cooperating surface and a second cooperating surface, the method comprising the steps of: [1] *cleaning* at least one of the cooperating surfaces *to remove surface contamination*; [2] *drying* the at least one *cleaned* surfaces; and, [3] applying a coat of a Self-Assembled Monolayer of Phosphonate (SAMP) composition to at least one of said *cleaned and dried surfaces*, said SAMP composition reducing paraffin or asphaltene deposition on the at least one of said surfaces.

’892 Patent at 6:42–52 (emphasis added). Claim 1’s first and second limitations explicitly discuss cleaning cooperating surfaces to remove surface contamination and then drying those surfaces. By the third limitation, which includes the “reducing” language at issue here, the cooperating surfaces are clear of paraffins or asphaltenes and there are no paraffins or asphaltenes to reduce.

While e9’s contends that, under its view, claims 1, 4, 7, and 13 are not complete until the cooperating surfaces are later exposed to paraffins or asphaltenes, such a construction would render dependent claims 10–12 meaningless. In the ’892 Patent, claims 10–12 depend on independent claim 7⁹ and claims 10–12 contemplate the introduction of the treated cooperating surfaces to crude oil (claim 10) or paraffins and asphaltene (claims 11–12). ’892 Patent at 7:24–8:8. Indeed, such steps would be redundant if, by the conclusion of claim 7, the treated surfaces had already encountered paraffins or asphaltenes. Put simply, claim 7 would swallow dependent claims 10–12 if the Court adopts e9’s construction.

Granted, as e9 argues in response, “the presumption of differentiation in claim scope is ‘not a hard and fast rule,’” and “any presumption created by the doctrine of claim differentiation ‘will be overcome by a contrary construction dictated by the written description or prosecution

⁹ Claim 7 includes the “reducing” language at issue. ’892 Patent at 7:13–15.

history.” *Littelfuse, Inc. v. Mersen USA EP Corp.*, 29 F.4th 1376, 1380 (Fed. Cir. 2022). But where the specification supports a construction that gives meaning to all claims, that construction is likely the correct one. *Id.* And though e9 contends that its proposed construction is consistent with the specification’s statement that the ’892 Patent “relates to coatings for reduction of paraffin and asphaltene deposition,” this statement similarly supports Aculon’s proposed construction. ’892 Patent at 1:23–24. The other excerpts of the specification cited by e9 similarly support Aculon’s construction. *See* ECF No. 71 at 12.

To the extent that there is “heavy presumption” in favor of e9’s proposed construction here, Aculon has demonstrated that its construction is the proper one.¹⁰ Further, other courts have construed similar terms in the same manner. *See Zen Design*, 2018 U.S. Dist. LEXIS 61032, at *16 (construing “emitting” to mean “capable of emitting”).

Accordingly, the Court construes “said SAMP composition reducing paraffin or asphaltene deposition on the at least one of said surfaces” to mean “said SAMP composition capable of reducing paraffin or asphaltene deposition on the at least one of said surfaces.”

¹⁰ The Court observes that on the one hand, e9 contends there is a “heavy presumption” in its favor as it allegedly presses the “customary meaning” of the claim term. ECF No. 71 at 13 (citing *Home Diagnostics, Inc. v. Lifescan, Inc.*, 381 F.3d 1352, 1355 (Fed. Cir. 2004)). On the other hand, Aculon points out that a proposed construction that renders a dependent claim superfluous, such as e9’s proposed construction here, is “presumptively unreasonable.” *Beachcombers, Int’l, Inc. v. Wildewood Creative Prods.*, 31 F.3d 1154, 1162 (Fed. Cir. 1994).

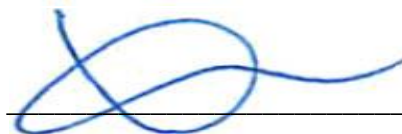
CONCLUSION

Accordingly, the Court construes the four contested claim terms as follows:

<u>Term</u>	<u>Construction</u>
“where A is an oxygen radical or a chemical bond”	“where A is a molecule containing an oxygen atom with an available electron or a chemical bond directly between the C_nF_{2n+1} group on the left side of A and the $(CF-CF_2-O)_b$ group on the right side of A”
“metal-phosphorous covalent bond”	“a covalent bond between a metal atom and a phosphorous atom”
“wetted part”	“a part of the sensor assembly that comes into contact with hydrocarbon liquids or other liquids”
“said SAMP composition reducing paraffin or asphaltene deposition on the at least one of said surfaces”	“said SAMP composition capable of reducing paraffin or asphaltene deposition on the at least one of said surfaces.”

It is so **ORDERED**.

SIGNED this 21st day of August, 2024.



XAVIER RODRIGUEZ
UNITED STATES DISTRICT JUDGE